



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> :

B01J 8/02, 8/08, B01F 23/90

A1

(11) International Publication Number:

WO 00/24505

(43) International Publication Date:

4 May 2000 (04.05.00)

(21) International Application Number: PCT/US99/24920

(22) International Filing Date: 21 October 1999 (21.10.99)

(30) Priority Data:

09/177,079

23 October 1998 (23.10.98)

US

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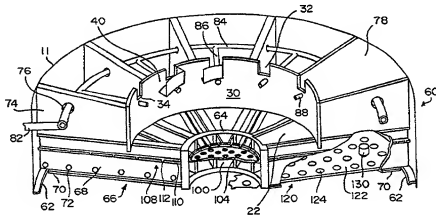
(81) Designated States: AE, AL, AM, AT, AU (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, IS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

## Published

With international search report.

With amended claims.

(54) Title: REACTOR DISTRIBUTION APPARATUS AND QUENCH ZONE MIXING APPARATUS



## (57) Abstract

A quench zone mixing apparatus (16) that occupies a low vertical height and has an improved mixing efficiency and fluid distribution across the catalyst surface includes a swirl chamber (20), a rough distribution network (100), and a distribution apparatus (120). In the swirl chamber (20), reactant fluid from a catalyst bed above is thoroughly mixed with a quench fluid by a swirling action. The mixed fluids exit the swirl chamber (20) through an aperture to the rough distribution system (100) where the fluids are radially distributed outward across the vessel to the distribution apparatus (120). The distribution apparatus (120) includes a plate (122) with a number of bubble caps (130) and associated a drip trace (150) that multiply the liquid drip stream from the bubble caps (130) to further symmetrically distribute the fluids across the catalyst surface. Alternatively, deflector baffles may be associated with the bubble caps (130) to provide a wider and more uniform liquid distribution below the plate (122). The distribution apparatus (120) can be used in the reaction vessel (10) without the swirl chamber (20) and rough distribution system (100), e.g., at the top of a vessel.